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B8P PAX PK5

(56) Documents Cited
EP 0725017 A1 WO 97/14614 A1 WO 91/03407 A1
WO 90/02687 A1 US 4685273 A

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(54) Abstract Title
A sealed container

(57) A container comprises a base 16 and lid 1 which are sealed peripherally together and of which one is capable of flexing, and thus distorting, as a consequence of a pressure variation within the so-sealed container, wherein a predefined portion of the wall area of the base and/or lid 4 is, in preference to the remainder of the wall area of the base and/or lid, arranged to flex inwardly and/or outwardly of the container, to compensate for any variation in the pressure within the container, thereby preventing any distortion of the remainder of the wall area of the base and/or lid. Furthermore, one of the base 16 and lid 1 may include at least one projecting lug, such as a castellation 15, which is located inwardly of the corresponding flange 3 or other outwardly projecting rim and which is engaged snugly with a complementary inner portion of the other of the base and lid. The container may contain a fresh meat product preserved in a mixture of oxygen and carbon dioxide.

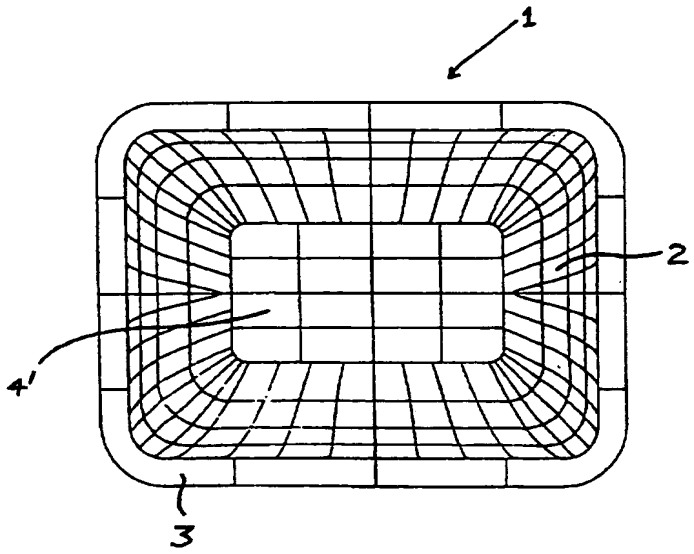

FIGURE 1

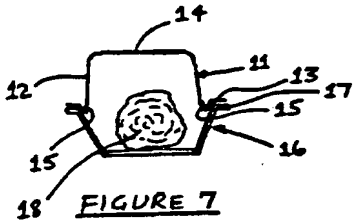

FIGURE 7

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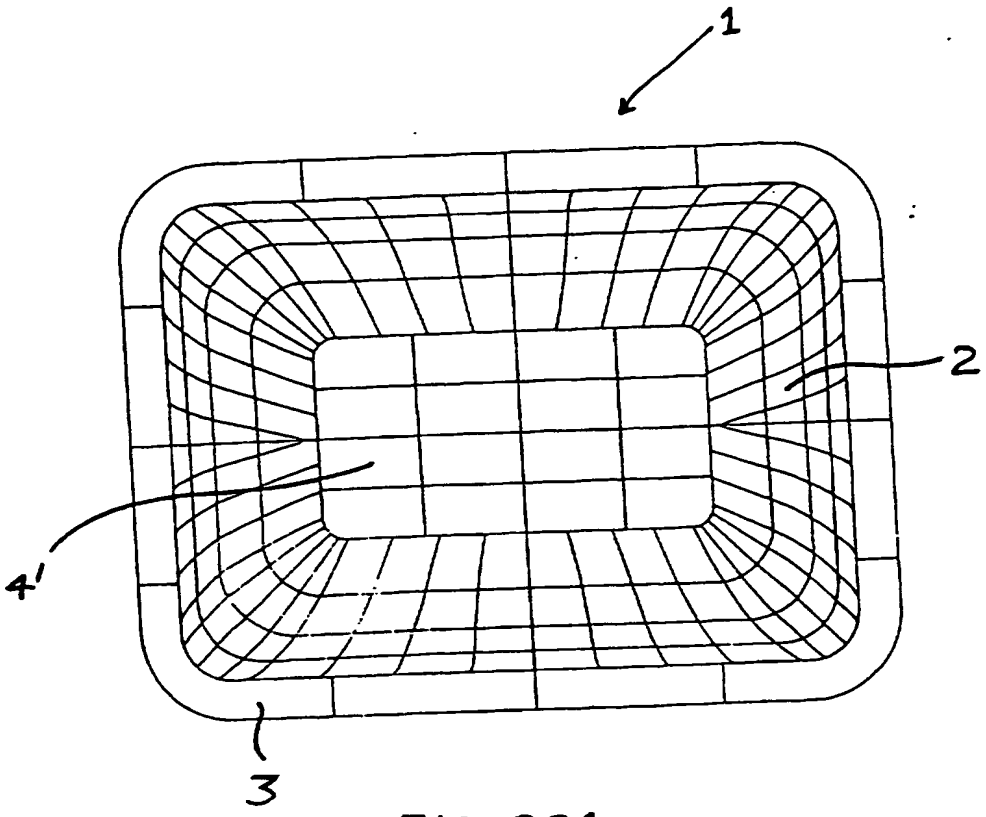
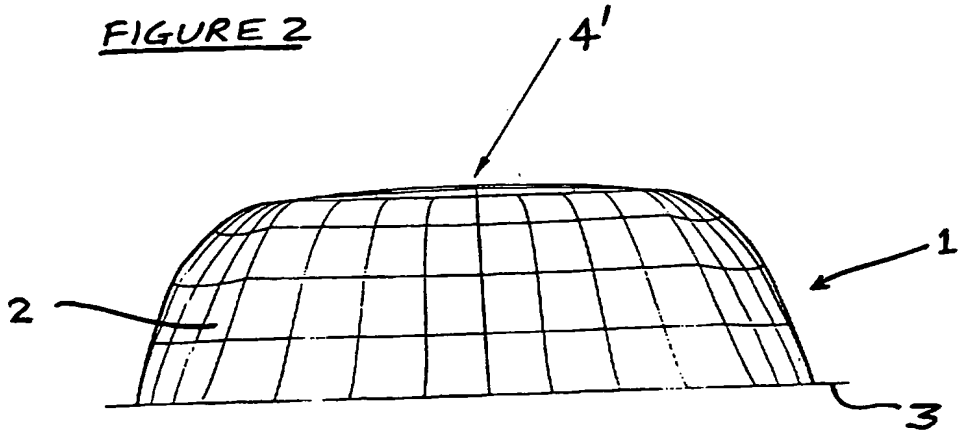


FIGURE 1

FIGURE 2



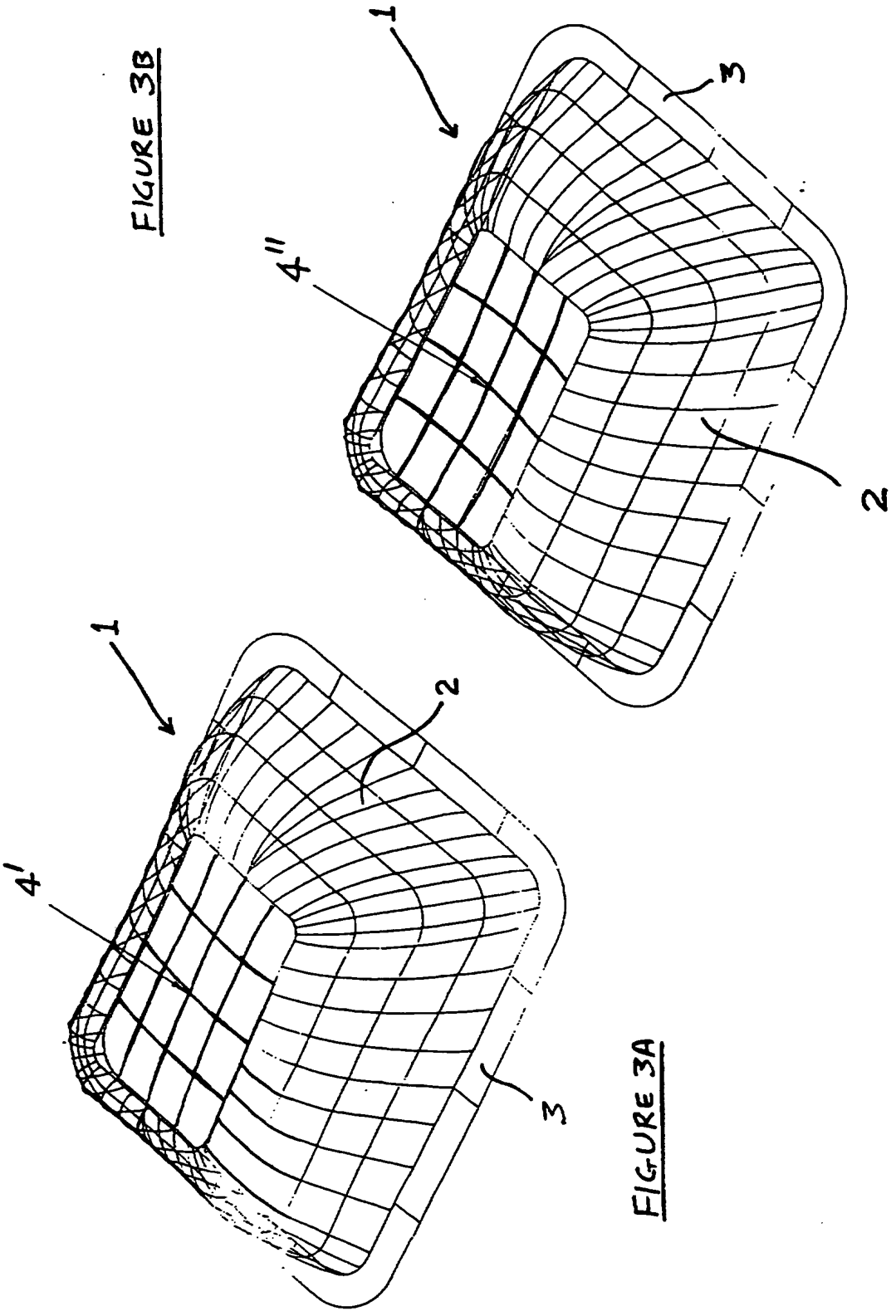


FIGURE 3A

FIGURE 3B

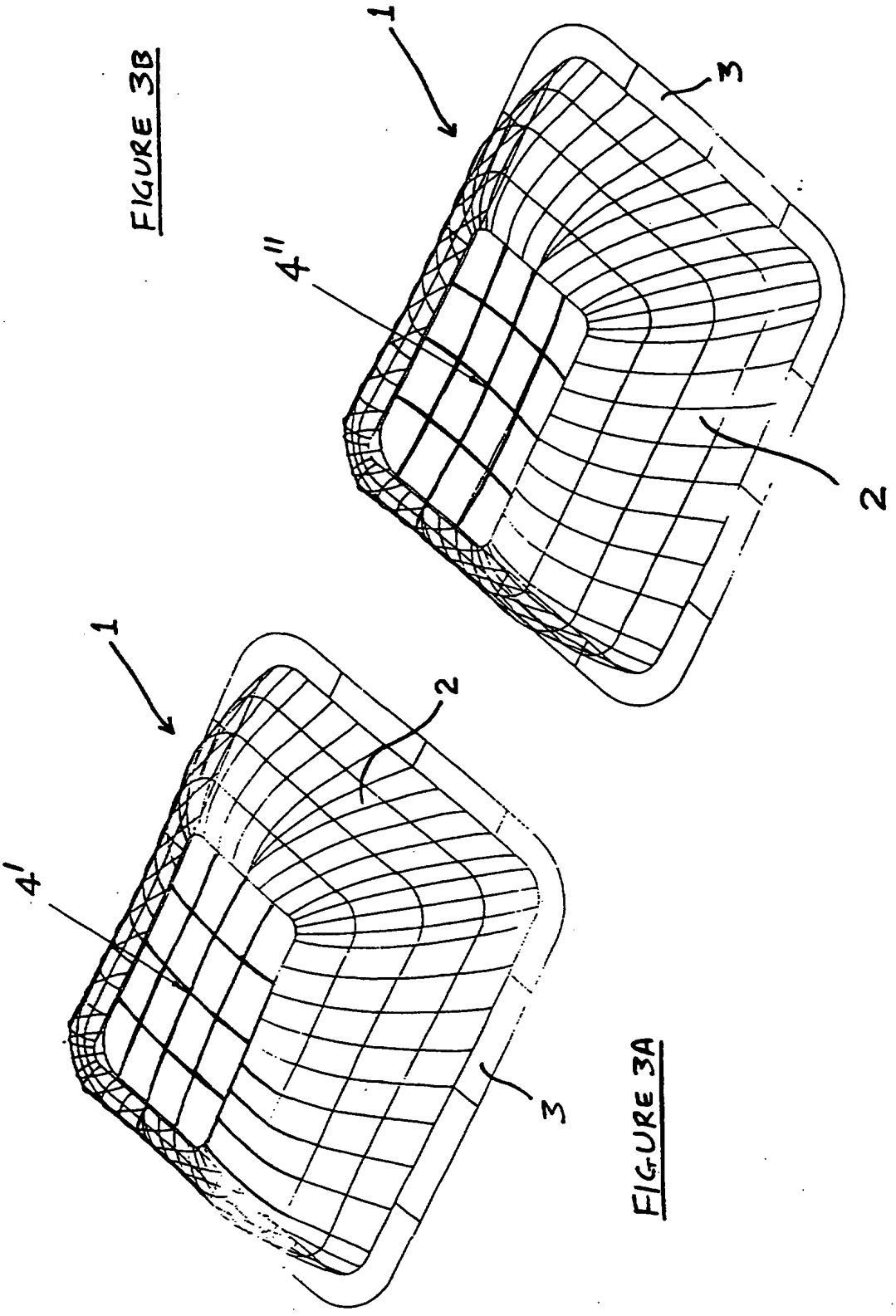


FIGURE 3B

FIGURE 3A

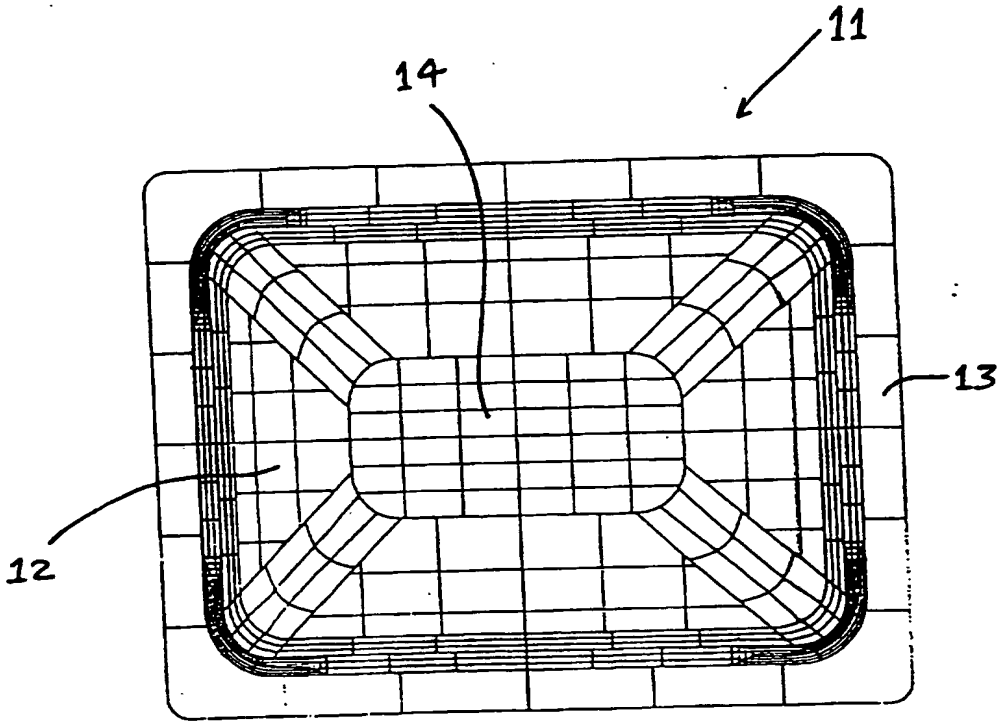


FIGURE 4

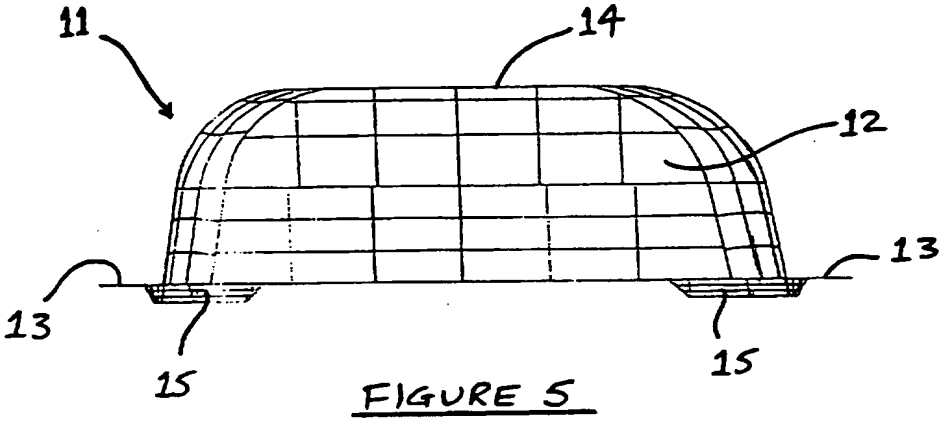


FIGURE 5

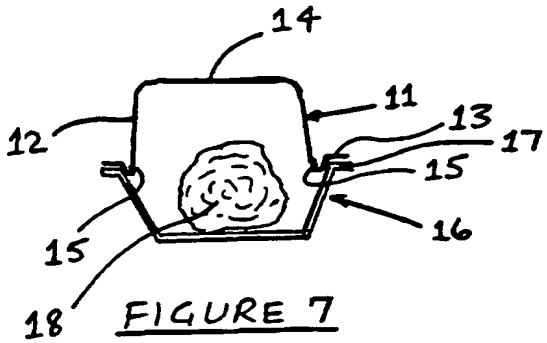


FIGURE 7

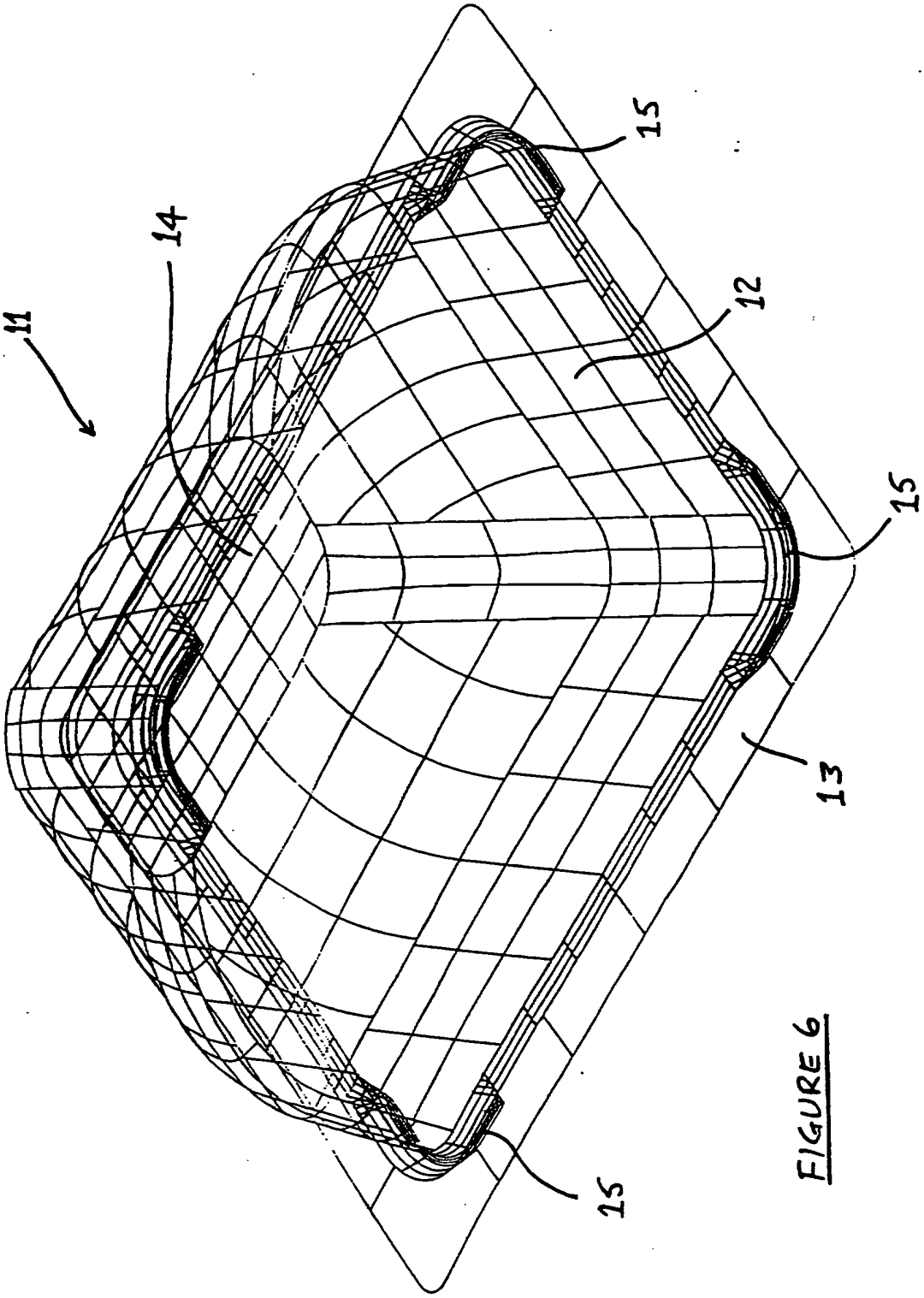


FIGURE 6

SEALED CONTAINER

DESCRIPTION

This invention relates to a container comprising two parts, namely a base and lid, which are sealed peripherally together and of which at least one is capable of flexing, and thus distorting, as a consequence of a pressure variation within the so-sealed container.

Typical containers of this type are used commonly for the storage and display, at point-of-sale, of fresh food products, such as fresh meat, fresh produce, including cut flowers, and growing plants, with at least the lids thereof being of a transparent, flexible plastics material, so that the products contained therein, can be viewed readily.

When such a container is used to package, say, fresh meat, a portion thereof is placed in the base which is then passed into the evacuation chamber of a modified atmosphere packaging machine, with the lid suspended above the meat-containing tray. Then, the chamber is evacuated of air and a gas, such as a mixture of oxygen and carbon dioxide gases, is pumped into the chamber and subsequently the lid is lowered on to the meat-containing base, such that respective outwardly extending peripheral flanges or rims on the base and lid are in engagement with each other. A sealing frame is then brought into engagement with either or both of the peripheral flanges or rims of the base and lid, to seal the base and lid together in a gas-tight manner.

The pressure of the gas, such as the mixture of oxygen and carbon dioxide gases, within the now-sealed, meat-containing container is usually slightly positive, that is to say, it is slightly above ambient atmospheric pressure. Such gases, and particularly any carbon dioxide gas, are absorbed slowly by the meat within the sealed container, thereby reducing the internal pressure thereof. Because the material from which the container, that is to say, the base and lid, is made, is usually a comparatively thin plastics material capable of flexing, such reduction in the internal pressure of the sealed container can cause any part or parts of the container walls to flex inwardly, thereby distorting the shape of the container and, as a consequence, destroying, or at least substantially spoiling, the integrity and, also, the aesthetic appearance of the container, which is particularly detrimental when the container, and its contents, are placed upon display at point-of-sale. In certain circumstances, large areas of the sealed container walls can collapse inwardly, thereby completely destroying the aesthetic appearance of the container and, possibly, causing rupture thereof.

It is an object of the present invention to provide a sealed container for the storage and/or display of a product, such as fresh meat product, at point-of-sale, which overcomes, or at least substantially reduces, the disadvantages associated with known types of sealed product container, as discussed above.

Accordingly, a first aspect of the invention resides in a container comprising a base and lid which are sealed peripherally together and of which one is

capable of flexing, and thus distorting, as a consequence of a pressure variation within the so-sealed container, wherein a predefined portion of the wall area of the base and/or lid, and preferably the latter, is, in preference to the remainder of the wall area of the base and/or lid, arranged to flex inwardly and/or outwardly of the container, to compensate for any variation in the pressure within the container, thereby preventing any distortion of the remainder of the wall area of the base and/or lid.

Preferably, the lid includes that predefined portion of wall area, although such may form part of the wall area of the base. Alternatively, each of the base and lid may include such a predefined wall area portion.

In the preferred embodiment of inventive container to be described hereinbelow, that predefined wall area portion constitutes the top of the lid of the container, which lid is preferably dome-shaped, with the base being comparatively shallow. However, and particularly when a label is to be affixed to the top of the lid, such a predefined wall area portion may be provided at one or more side walls of the lid.

Thus, when a product, such as a fresh meat product, is placed in the base and the lid is subsequently sealed thereto, any reduction in the internal pressure of the so-sealed container, due to, say, absorption and/or chemical reaction of the gas, such as a mixture of oxygen and carbon dioxide gases, by or with the product, is compensated for by a corresponding flexure of the predefined wall area portion, thereby preventing any distortion of the

remainder of the area of the base and/or lid.

The flexibility of the predefined wall portion of the base and/or lid is such that its flexure is preferably directly proportional to the variation in the internal pressure of the sealed container.

In the preferred embodiment, the predefined wall area portion is initially bowed outwardly of the base and/or lid, such that, if the pressure within the container reduces, that portion flexes inwardly of the container, such that, finally, it is bowed inwardly of the container.

In an embodiment of the inventive container, with the base and lid sealed together at respective peripheral flanges or other outwardly extending rims thereof, one of the base and lid, and preferably the lid, includes at least one projecting lug, such as a castellation, which is located inwardly of the corresponding flange or other outwardly projecting rim and which is engaged snugly with a complementary inner portion of the other of the base and lid.

In accordance with a second aspect of the invention, there is provided a container comprising a base and lid which are sealed together by means of respective peripheral flanges or other outwardly extending rims, wherein one of the base and lid includes at least one projecting lug, such as a castellation, which is located inwardly of the corresponding peripheral flange or other outwardly extending rim and which is engaged with a complementary inner portion of the other of the base and lid.

In a preferred embodiment of the second aspect of inventive container to be described hereinbelow, a generally rectangular lid is provided with such a lug, in the form of a castellation, at each of its four corners. Each castellation is engaged with the complementary-shaped corner portion of the base, inwardly of its peripheral flange or other outwardly extending rim.

The invention also provides a product package comprising a sealed container in accordance withe the first or second aspect of the invention, or any modifications thereof, and a product housed therein.

In order that the various aspects of the inventive container can be more fully understood, preferred embodiments in accordance therewith will now be described by way of example and with reference to the accompanying drawings in which:

Figure 1 is a plan view of an embodiment of lid of a container in accordance with the first aspect of the invention;

Figure 2 is an elevational view of the lid shown in Figure 1;

Figures 3A and 3B are respective perspective views of the container lid shown in Figures 1 and 2, in two different configurations thereof;

Figures 4, 5 and 6 are respective plan, elevational and perspective views of a lid of an embodiment of container in accordance with the second aspect of the invention; and

Figure 7 is a sectional view of the lid of Figures 4 to 6 fitted and sealed to a base of the container.

Referring firstly to Figures 1, 2 and 3A of the accompanying drawings, which are line profile drawings of a generally rectangular lid 1 of a container for the storage and display, at point-of-sale, of a fresh meat product.

The lid 1 is made of a transparent plastics material having a domed, flexible but self-supporting portion 2 around whose lower periphery extends a generally flat, outwardly projecting flange or rim 3.

At 4′ is indicated generally the top of the domed portion 2 of the lid 1. That top 4′ is generally planar but, in those three Figures, is shown as being bowed slightly outwardly of the lid 1. In Figure 3B, that top is indicated generally at 4′′ and is shown as being bowed slightly inwardly of the lid 1.

On assembly of the corresponding container, a meat product (not shown) is placed in a tray-shaped base (also not shown) which is then passed into the evacuation chamber of a modified atmosphere packaging machine, where the lid 1, with its top 4′ bowed slightly outwardly thereof, is suspended above the meat product-containing base, with its top 4′ bowed slightly outwardly thereof.

Then, the air within the chamber of the modified atmosphere packaging machine is evacuated and replaced by a mixture of oxygen and carbon dioxide gases. Subsequently, the lid 1 is lowered on to the meat

product-containing base, with its peripheral flange or outwardly projecting rim 3 engaging a corresponding peripheral flange or rim of the base. In known manner, a heated sealing frame engages the flange or rim 3, to seal the lid 1 to the base flange or rim. In this manner, the so-sealed container contains both the meat product and an atmosphere of a mixture of oxygen and carbon dioxide gases. The pressure within the initially-sealed container is slightly positive, that is to say, it is slightly above ambient atmospheric pressure, with the top 4' of the lid 1 bowed slightly outwardly thereof.

As time passes, the gases, and particularly the carbon dioxide gas, within the now-sealed container is absorbed, either by physical absorption or chemical reaction, by the meat product and, as a result, the pressure within the sealed container reduces accordingly. As a consequence, the flexibility of the top 4' of the lid 1 causes that top to flex inwardly of the container and, eventually, assumes its slightly inwardly bowed configuration as shown generally at 4'' in Figure 3B. The amount by which the top 4' flexes inwardly of the lid 1 may or may not be directly proportional to the extent at which the internal pressure of the container decreases.

In this manner, the interior pressure reduction of the sealed container is compensated for by the flexure of the top of the lid 1 from its outwardly bowed position, as shown at 4' in Figure 3A, into its inwardly bowed position, as shown in Figure 3B. Thus, any inward flexure, and thus undesirable distortion, of the remainder of the wall area of the lid 1 and, also, the base of the container which might otherwise

occur, is prevented, thereby maintaining the overall integrity and general appearance of the sealed, meat product-containing container.

Referring now to Figures 4 to 7 of the accompanying drawings, here there is shown, again in line profile, a second embodiment of container in accordance with the second aspect of the invention, of which only the lid, as indicated generally at 11, is shown in Figures 4, 5 and 6. Again, that lid 11 comprises a domed portion 12 and, extending around the lower periphery thereof, a generally planar, outwardly-extending flange or rim 3 which can be sealed to a corresponding flange or rim of a tray-shaped base (not shown) of the container.

In this embodiment, however, the lid 11 is provided with a castellated portion 15 which projects downwardly thereof and is located generally inwardly of the peripheral flange or rim 13. Such a castellated portion 15 is provided at each corner of the generally rectangular lid 11.

Each of the four castellated portions 15 is shaped and dimensioned to engage snugly with a complementary corner portion of a base 16 of the container, as shown in Figure 7.

Here, the lid 11 and base 16, in which a meat product 18 is received, are shown just prior to their being sealed together at their respective peripheral flanges or rims 13,17.

The generally planar top 14 of the lid 11 may or may not be similar to the top 4' of the container lid

1 described above with respect to the first embodiment of container described above. Also, it should be noted that the castellated portions 15 may be located at other positions around the lower periphery of the domed portion 12 of the lid 11, depending upon the particular application thereof.

The function of the castellated portions 15 of the lid 11 are to:

locate the lid 11 precisely in engagement with the tray-shaped base 16 of the container, when fully seated thereon;

maintain the position of the lid 11 with respect to the base 16, even when those two components 11,16 of the container are separated up to the depth of the castellated portions 15;

permit evacuation of excess gases from the interior of the container on closure of the lid 11 and base 16 within the modified atmosphere packaging machine, which would otherwise tend to inhibit such closure;

guide the lid 11 into the base 16 just prior to the sealing operation within the MAP sealing machine;

improve the rigidity of the lid 11; and

retain the lid 11 upon the base 16 when indexing the lid 11 and tray 16 prior to sealing thereof.

Although the embodiments of inventive container

described above with reference to Figures 1 to 3 of the drawings has the top 4' of its lid 1 as the predefined portion of the wall area of the lid 1 which can flex inwardly and/or outwardly of the container, it is to be appreciated that such a flexible portion can be provided at other areas of the lid 1. For example, if the lid top 4' is to receive a label thereon, then a predefined wall area portion may be provided at one or more side walls of the lid 1.

CLAIMS

1. A container comprising a base and lid which are sealed peripherally together and of which one is capable of flexing, and thus distorting, as a consequence of a pressure variation within the so-sealed container, wherein a predefined portion of the wall area of the base and/or lid is, in preference to the remainder of the wall area of the base and/or lid, arranged to flex inwardly and/or outwardly of the container, to compensate for any variation in the pressure within the container, thereby preventing any distortion of the remainder of the wall area of the base and/or lid.

2. A container according to claim 1, wherein the lid includes the predefined portion of wall area.

3. A container according to claim 1, wherein part of the wall area of the base includes the predefined portion.

4. A container according to claim 1, wherein each of the base and lid includes such a predefined wall area portion.

5. A container according to claim 2 or 4, wherein the top of the lid of the container comprises the predefined wall area portion.

6. A container according to claim 2 or 4, wherein one or more side walls of the lid includes such a predefined wall area portion

7. A container according to any preceding claim, wherein the lid is dome-shaped, with the base being comparatively shallow.

8. A container according to any preceding claim, wherein any reduction in the internal pressure of the so-sealed container, due to absorption and/or chemical reaction of the gas by, or with, the product, in use, is compensated

for by a corresponding flexure of the predefined wall area portion, thereby preventing any distortion of the remainder of the area of the base and/or lid.

9. A container according to claim 8, wherein the gas is a mixture of oxygen and carbon dioxide gases,

10. A container according to claim 8 or 9, wherein the flexibility of the predefined wall portion of the base and/or lid is such that its flexure is directly proportional to the variation in the internal pressure of the sealed container.

11. A container according to any preceding claim, wherein the predefined wall area portion is initially bowed outwardly of the base and/or lid, such that, if the pressure within the container reduces, that portion flexes inwardly of the container, such that, finally, it is bowed inwardly of the container.

12. A container according to any preceding claim, wherein one of the base and lid includes at least one projecting lug which is located inwardly of the corresponding flange or other outwardly projecting rim and which is engaged snugly with a complementary inner portion of the other of the base and lid.

13. A container according to claim 12, wherein the projecting lug is a castellation.

14. A container according to claim 12 or 13, wherein the projecting lug is located on the lid

15. A container comprising a base and lid which are sealed together by means of respective peripheral flanges or other outwardly extending rims, wherein one of the base and lid includes at least one projecting lug which is located inwardly of the corresponding peripheral flange or other outwardly extending

rim and which is engaged with a complementary inner portion of the other of the base and lid.

16. A container according to claim 15, wherein the lug is a castellation.

17. A container according to claim 15 or 16, wherein the lid has a rectangular cross-section.

18. A container according to claim 15, 16 or 17, wherein the lid is provided with the lug.

19. A container according to claim18, wherein the lid has a lug at each of its four corners.

20. A container according to claim 19, wherein each castellation is engaged with a complementary-shaped corner portion of the base, inwardly of its peripheral flange or other outwardly extending rim.

21. A product package comprising a sealed container in accordance with the first or second aspect of the invention, or any modifications thereof, and a product housed therein.

22. A container substantially as herein described and with reference to the accompanying drawings.

23. A product package substantially as herein described and with reference to the accompanying drawings.

The Patent Office

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INVESTOR IN PEOPLE

Application No: GB 9811269.1
Claims searched: 1 14, 22 and 23

Examiner: Dr Claire L Williams
Date of search: 11 August 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): B8P PAX

Int Cl (Ed.6): B65B 7/28, 31/02 B65D 77/20, 79/00, 81/20

Other: ONLINE: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
Y	EP 0725017 A1	(WYSLOTSKY) in particular Figures 2 and 3.	12 - 14
X, Y	WO 97/14614 A1	(DIAMOND) whole document	X: 1, 2, 5, 8, 10 Y: 9
Y	WO 91/03407 A1	(GARWOOD) whole document	9
X	WO 90/02687 A1	(KAL KAN FOODS) whole document	1, 3, 11
X, Y	US 4685273	(AMERICAN CAN CO) whole document	X: 1 - 5 Y: 12 - 14

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.